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REMARKS

Claims 1, 7 and 11 are amended. Claims 1-15, as amended, remain in the application. No new matter is added by the amendments to the claims.

The Rejections:

In the Office Action dated April 20, 2007, the Examiner rejected Claims 1-15 under 35 U.S.C. 103(a) as being unpatentable over De Angelis (5,566,786) in view of LaNieve et al (5,437,899).

Regarding Claims 1, 3, 4 and 6 - 9, the Examiner stated that De Angelis discloses an elongated load-bearing support device (1) with load bearing strands (4), each having a plurality of fibers (5) of a base material in a first phase (aramid fibers (Col. 2, Line 38)) and the strands being surrounded by a sheath (7). The reinforcing material of De Angelis is of a second phase, yet it is externally applied to the base material as "... an impregnating medium, for example polyurethane solution, for the protection of the fibers 5" (Col.3, Line 57) whereby the bending fatigue strength of the strands is increased.

Attention is directed to LaNieve, as cited for reference in previous office actions, teach, "... polymers have been mixed with particulate matter and made into fibers..." (Col. 1, Line 54), whereby the particulate matter of their invention being "...an elemental metal or metal alloy, or may be nonmetallic..." (Col. 6, Line 14), whereby their polymer is an aromatic polyamide known as aramid. LaNieve et al teach further that such addition of particulate matter will enhance the flexural strength (modulus of elasticity in shear) of the fiber, with a minimized reduction in loss of tensile strength.

According to the Examiner, it would have been obvious to one of ordinary skill in the art to modify the base material of De Angelis with the teaching of LaNieve, in order to gain the features of materials of high flexural strength for applications whereby the material is to maintain a load while experiencing frequent/continuous radial deflection, for safety and durability.

Regarding Claim 2, the Examiner stated that De Angelis discloses his strands having a plurality of fibers (5) formed into a cable (4 and, in total, 1).

Regarding Claims 5 and 10, as noted above, LaNieve at al teach a reinforcing material as particulate matter, such as platelets and needles (Col. 6, Line 35).

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Regarding Claims 11-15, the Examiner stated that the devices of Claims 1-10 would necessarily have to be formed in order to function. It would have been obvious to perform all the method steps of Claims 11-15 when producing the device of De Angelis as modified by LaNieve above, in a usual and expected fashion, in as much as the method claims recite no limiting steps beyond producing each of the components.

Regarding Claim 11, the Examiner stated that De Angelis discloses an elongated load-bearing support device (1) with fibers (5) from a base material in a first phase (aramid fibers) and a reinforcing material in a second phase ("... an impregnating medium, ...polyurethane solution), with the load-bearing strands (4) thereof being surrounded by a sheath (7). LaNieve et al teach further "... polymers have been mixed with particulate matter and made into fibers..."

Regarding Claim 12, the Examiner stated that De Angelis and LaNieve disclose a base material selected from aramid.

Regarding Claim 13, the Examiner stated that De Angelis discloses a reinforcing means by impregnation with a polyurethane solution to increase the bending fatigue strength of the base material, whereas LaNieve et al teach a reinforcing material as "...an elemental metal or metal alloy..." which is used to fill their base material.

Regarding Claim 14, the Examiner stated that LaNieve et al teach further that addition of particulate matter will enhance the flexural strength (modulus of elasticity in a radial direction).

Regarding Claim 15, the Examiner stated that LaNieve at al teach a reinforcing material as particulate matter, such as platelets and needles.

The Response:

Applicant amended independent Claims 1, 7 and 11 to clarify that the reinforcing material increases a modulus of elasticity of the strands for supporting at least one of an elevator car and an elevator counterweight.

The Examiner stated that Applicant's arguments filed 5 April 2007 with respect to Claim 1 have been fully considered but they are not persuasive. As noted above and reviewed in the previous office action, LaNieve teaches the enhancement of his shear strength at a minimized cost to his tensile strength, thereby increasing a modulus of elasticity of his strands in a radial direction. Emphasis with respect to the directional properties of composite materials, in

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particular to the orientation and type/form of reinforcing material, is herein made. Neither the original claim language nor the amended claim language overcame the rejections based on the prior art of record of the previous office action.

The examiner states on Page 2 of the Office Action:

> Attention is directed to LaNieve et al, as cited for reference in previous office actions, teach, "... polymers have been mixed with particulate matter and made into fibers..." (Col. 1, Line 54), whereby the particulate matter of their invention being "...an elemental metal or metal alloy, or may be nonmetallic..." (Col. 6, Line 14), whereby their polymer is an aromatic polyamide known as aramid. LaNieve et al teach further that such addition of particulate matter will enhance the flexural strength (modulus of elasticity in shear) of the fiber, with a minimized reduction in loss of tensile strength.
>
> It would have been obvious to one of ordinary skill in the art to modify the base material of De Angelis with the teaching of LaNieve et al, in order to gain the features of materials of **high flexural strength** for applications whereby the material is to maintain a load while experiencing frequent/continuous radial deflection, for safety and durability. (Emphasis added)

However, the problem to be solved by the present invention is to increase the modulus of elasticity of elevator aramid ropes, which modulus is too low in comparison with the modulus of elasticity of steel ropes, and **not to increase their flexural strength**. The flexural strength of elevator ropes must be minimized, since such ropes must exhibit a very low minimum bending radius in order to wind around the traction sheave of the drive.

The person skilled in the art of elevators and starting from De Angelis would therefore never consider the LaNieve fibers for protective apparel to solve this problem.

LaNieve teaches that the addition of particulate matter reduces the tensile modulus of elasticity of polymer fibers. In particular, LaNieve recites at column 2, lines 28-39:

> However, the addition of particles to certain types of aromatic polyamide fibers can have a **severe detrimental impact on fiber tensile strength**. In particular, the addition of particles to "para-aramid" fibers, such as Kevlar®, spun from lyotropic liquid crystal solutions, can significantly reduce the tenacity and

> elongation of the resulting fibers. It is believed the inclusion of such particles disrupts the liquid crystalline structure of the para-aramid fiber, thereby decreasing tensile strength. Still further, the presence of hard particles in aramid fibers generally can abrade downstream textile equipment. (Emphasis added)

A decrease of the tensile strength of the fibers for a rope in elevator equipment is absolutely unacceptable, because it can lead to the crash of the elevator car. Thus, the LaNieve document discourages dramatically the person skilled in the art of elevators willing to increase the modulus of elasticity of elevator aramid ropes from adding second phase particles into the polymer matrix of the fibers. US Patent No. 6,162,538 clearly leads the man skilled of the art away from the claimed invention.

The combination of LaNieve with De Angelis proposed by the Examiner is totally artificial, arbitrary and based on "a posteriori" reasoning. The person skilled in the art of elevators has no incentive to consider LaNieve, rather has many serious reasons to exclude this document from consideration.

According to the Examiner, LaNieve teaches "further that such addition of particulate matter will enhance the flexural strength of the fiber, while reducing its tensile strength (modulus of elasticity). This observation by the Examiner is confirmed in LaNieve Col. 7, Lines 11-16. Thus, the combination suggested by the Examiner does not increase the modulus of elasticity as recited in Applicant's amended claims.

The Examiner stated that the prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The Examiner cited Sandt (5,576,081), Oleson et al (4,956,039) and Mott (Applied Strength of Materials, 4th Ed.) for an elongated structural element filled with a polymer binder in liquid form with a dispersion of fiber reinforcement material; a cable-like composite body comprising a thermoplastic sleeve that "...is preferably filled with reinforcement elements having a high modulus of elasticity..." as well as a core string comprising a thermoplastic material with filaments of "...preferably E-.. S-glass..."; and a brief overview of composite structures addressing the impact of the amount, type, structure and orientation of reinforcing materials on both strength and modulus of elasticity, respectively. Applicant reviewed these references and found them to be no more pertinent than the prior art relied upon by the Examiner in the rejections.

Furthermore, the Examiner listed a July 2001 date for the Mott publication, but the second page of the copy lists a 2002 copyright date.

In view of the amendments to the claims and the above arguments, Applicant believes that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.

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